Claims:

1. A re-legging arrangement to perform automatic re-legging of devices of a hard intellectual property (IP) layout source design.

2. A re-legging arrangement as claimed 1, the re-legging arrangement automatically deciding on a number of new legs for a device according to the formula of:

$$N_{new} = \max\{N_{old}, \lceil (W_{old} \times f)/W_m \rceil\}$$

N_{new} - Device width in schematics before resizing.

W_{old} - Device width in schematics before resizing.

N_{old} - Number of legs realizing this device in source layout.

f - Upsize factor

W_m - Maximal leg size in layout we wish to occur due to re-legging.

3. A re-legging arrangement as claimed 2, the re-legging arrangement adapted to add an even number of legs to the device according to the modified formula of:

$$N_{new} = N_{old} + \lfloor (N_{new} - N_{old} + 1)/2 \rfloor \times 2$$

4. A re-legging arrangement as claimed 1, the re-legging arrangement adapted to automatically perform at least two operations selected from the list of: a jog treatment to add jogs to source design; a device candidate selection to select devices in the source design as candidates for re-legging; a gate expansion treatment to expand a gate of selected devices to fit re-legging; a leg number determination to determine a number of legs for selected devices; a slot treatment to define at least one slotted gate area for removal for relegging; a trimming treatment to remove the at least one slotted gate area to divide a gate of selected devices into a plurality of legs; and, a contact treatment to insert at least one contact between legs of selected devices.

5. A hard intellectual property (IP) layout reuse system comprising:

a re-legging arrangement to perform automatic re-legging of devices of a hard intellectual property (IP) layout source design; and

a compactor to perform compaction of a re-legged source design from the re-legging arrangement, and to output a migrated layout in accordance with predetermined target process rules and user-specified constraints.

6. A hard IP layout reuse system as claimed 5, the re-legging arrangement automatically deciding on a number of new legs for a device according to the formula of:

$$N_{new} = \max\{N_{old}, \lceil (W_{old} \times f)/W_m \rceil\}$$

N_{new} - Device width in schematics before resizing.

W_{old} - Device width in schematics before resizing.

N_{old} - Number of legs realizing this device in source layout.

f - Upsize factor

W_m - Maximal leg size in layout we wish to occur due to re-legging.

7. A hard IP layout reuse system as claimed 6, the re-legging arrangement adapted to add an even number of legs to the device according to the modified formula of:

$$N_{new} = N_{old} + \lfloor (N_{new} - N_{old} + 1)/2 \rfloor \times 2$$

8. A hard IP layout reuse system as claimed 5, the re-legging arrangement adapted to automatically perform at least two operations selected from the list of: a jog treatment to add jogs to source design; a device candidate selection to select devices in the source design as candidates for re-legging; a gate expansion treatment to expand a gate of selected devices to fit re-legging; a leg number determination to determine a number of legs for selected devices; a slot treatment to define at least one slotted gate area for removal for relegging; a trimming treatment to remove the at least one slotted gate area to divide a gate of selected devices into a plurality of legs; and, a

contact treatment to insert at least one contact between legs of selected devices.

9. A machine-readable medium embodying a re-legging arrangement as programming instructions on a machine-readable medium, to program a machine to perform automatic re-legging of devices of a hard intellectual property (IP) layout source design.

10. A machine-readable medium as claimed 9, the re-legging arrangement automatically deciding on a number of new legs for a device according to the formula of:

$$N_{new} = \max\{N_{old}, \lceil (W_{old} \times f)/W_m \rceil\}$$

N_{new} - Device width in schematics before resizing.

W_{old} - Device width in schematics before resizing.

N_{old} - Number of legs realizing this device in source layout.

f - Upsize factor

W_m - Maximal leg size in layout we wish to occur due to re-legging.

11. A machine-readable medium as claimed 10, the re-legging arrangement adapted to add an even number of legs to the device according to the modified formula of:

$$N_{new} = N_{old} + \lfloor (N_{new} - N_{old} + 1)/2 \rfloor \times 2$$

12. A machine-readable medium as claimed 10, the re-legging arrangement adapted to automatically perform at least two operations selected from the list of: a jog treatment to add jogs to source design; a device candidate selection to select devices in the source design as candidates for re-legging; a gate expansion treatment to expand a gate of selected devices to fit re-legging; a leg number determination to determine a number of legs for selected devices; a slot treatment to define at least one slotted gate area for removal for relegging; a trimming treatment to remove the at least one slotted gate area to divide a gate of selected devices into a plurality of legs; and, a contact treatment to insert at least one contact between legs of selected devices.

13. A machine-readable medium embodying a hard intellectual property (IP) layout reuse system as programming instructions on a machine-readable medium, the reuse system comprising:

a re-legging arrangement to perform automatically re-legging of devices of a hard intellectual property (IP) layout source design; and

a compactor to perform compaction of a re-legged source design from the re-legging arrangement, and to output a migrated layout in accordance with predetermined target process rules and user-specified constraints.

14. A machine-readable medium as claimed 13, the re-legging arrangement automatically deciding on a number of new legs for a device according to the formula of:

$$N_{new} = \max\{N_{old}, \lceil (W_{old} \times f)/W_m \rceil\}$$

N_{new} - Device width in schematics before resizing.

W_{old} - Device width in schematics before resizing.

N_{old} - Number of legs realizing this device in source layout.

f - Upsize factor

W_m - Maximal leg size in layout we wish to occur due to re-legging.

15. A machine-readable medium as claimed 14, the re-legging arrangement adapted to add an even number of legs to the device according to the modified formula of:

$$N_{new} = N_{old} + \lfloor (N_{new} - N_{old} + 1)/2 \rfloor \times 2$$

16. A machine-readable medium as claimed 13, the re-legging arrangement adapted to automatically perform at least two operations selected from the list of: a jog treatment to add jogs to source design; a device candidate selection to select devices in the source design as candidates for re-legging; a gate expansion treatment to expand a gate of selected devices to fit re-legging; a leg number determination to determine a number of legs for selected devices; a slot treatment to define at least one slotted gate area for removal for re-legging; a trimming treatment to remove the at least one slotted gate area to divide a gate of selected devices into a plurality of legs; and, a contact treatment to insert at least one contact between legs of selected devices.